

REMARKS

Claims 1-13 are pending.

In the Office Action, claims 1-13 were rejected under 35 USC 102(b) as being anticipated by U.S. Patent No. 5,512,755 to Vickers, et al. ("Vickers"). This rejection is respectfully traversed.

The present invention discloses a photomultiplier tube (PMT) base with an integrated amplifier that operates off of the current provided to the dynode stages of the PMT. The integrated amplifier does not use any of the extra gain from the PMT itself and thus does not reduce the limited useable lifetime of the dynode stages. The present amplifier provides pulse amplification and device impedance conversion. By integrating the amplifier with the PMT high voltage divider circuit, the present invention not only reduces power consumption but also improves the signal to noise ratio. Further, because a reduced current can be used, better current stabilization is achieved and the useful life of the dynode stages is extended.

Claim 1, for example, recites "A photomultiplier tube base, comprising: electronic circuitry that provides stable power....for....a photomultiplier tube (PMT); and, an amplifying circuit for amplifying a PMT output signal....wherein, the electronic circuitry and the amplifying circuit are integrated into one replaceable component that receives power from a PMT high voltage divider..."

Vickers teaches a gamma camera with a unique gain control circuit. The gain control circuit provides uniform gain among the photomultipliers for various types of isotopes. The camera of Vickers achieves uniform gain by isolating one dynode, in the dynode stages of each photomultiplier tube (PMT), from its normal power source. A gain means is then provided in each PMT to supply a predetermined voltage to the isolated dynode stages. The voltage supplied to each isolated dynode is calculated, to ensure uniform gain in all the PMT's, during calibrations. The voltage to any isolated dynode can vary between the voltage applied to the previous stage, to the voltage applied to the succeeding dynode stage. Separate voltage potentials are calculated and stored for each gain means and for various isotopes.

Vickers fails to disclose a PMT base that provides power to the PMT and provides power to an amplifier that is integrated within the PMT base, wherein the amplifying circuit is integrated into one replaceable component that receives power from a PMT high voltage divider, as recited in claim 1. Vickers does not even deal with the problem that is solved by the present invention, providing an improved power circuit for individual PMT's. Rather, Vickers teaches providing a separate power source for an individual dynode inside an individual PMT.

Page 2 of the Office Action states that "Vickers discloses a gamma camera device comprising: electronic circuitry...and an amplifying circuit (34)...wherein: the electronic circuitry and the amplifying circuit (34) are integrated into one replaceable component that receives power from a PMT high voltage divider". What Vickers actually teaches is that amplifying circuit (34) is two circuit boards away from voltage divider circuit board (30). See Figure 3. Thus, in the system of Vickers, if the voltage divider and the amplifier needed to be replaced two circuit boards would physically have to be taken out and replaced. In Applicant's invention the two circuits are on the same board.

The Action further states on page 2 that "Vickers discloses the PMT output signal travels from an anode of the PMT to the amplifying circuit. See figure 4." What Figure 4 of Vickers actually shows is a schematic diagram of the voltage divider board (30). The amplifying circuit (34) of Vickers is not found anywhere on the voltage divider board (30) of Figure 4. Rather, the amplifying circuit (34) is located on the preamp circuit board, which is a separate component from board (30).

The Action still further asserts on page 3 that "Vickers discloses electrically connecting a dynode of the PMT to an input of the amplifying circuit so that the amplifying circuit receives the PMT output signal from the dynode of the PMT. See figure 1-4." What Figure 1 of Vickers actually shows is a general view of a gamma camera with basic components shown in block form. What Figure 2 of Vickers actually shows is a graph of an electrical pulse produced by a PMT. What Figure 3 of Vickers actually shows are the three circuit boards that are attached to the PMT. And, Figure 4 has been discussed above. What Figures 1-4 of Vickers do not show is "electrically

connecting a dynode of the PMT to an input of the amplifying circuit so that the amplifying circuit receives the PMT output signal from the dynode of the PMT".

Applicant has not been able to find any mention in Vickers relating to the direct connection of a dynode, or an anode, to an amplifying circuit that is integrated with the voltage divider circuit. Vickers simply does not deal with this aspect of PMT's. Rather, Vickers deals specifically with providing a separate power source to one of the dynodes in each of the PMTs. If Vickers taught Applicant's amplifying circuit arrangement, an amplifier would be found on circuit board 30, the same board that holds the voltage divider circuit. Such an amplifier has not been pointed out in the office action and Applicant has not been able to find one after a thorough search of Vickers.

For all of the above reasons, claim 1 is considered allowable over Vickers. Claims 2-6 depend from claim 1 and are considered allowable for at least the same reasons. Claims 7 recites similar features as claim 1 and is considered allowable for at least the same reasons. Claims 8-13 depend from claim 7 and are considered allowable for at least the same reasons.

All claims are believed to be in condition for allowance, and a Notice to that effect is respectfully requested. If any questions remain, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

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